

CE7



UNITED STATES PATENT AND TRADEMARK OFFICE

UNITED STATES DEPARTMENT OF COMMERCE
United States Patent and Trademark Office
Address: COMMISSIONER FOR PATENTS
P.O. Box 1450
Alexandria, Virginia 22313-1450
www.uspto.gov

| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
|--|-------------|----------------------|-------------------------------------|------------------|
| 09/744,097 | 01/16/2001 | David A Shafer | 1414.501U2 | 2981 |
| 7590 10/28/2005 | | | | |
| DR. BENJAMIN ADLER C/O ADLER & ASSOCIATION 8011 CANDLE LANE HOUSTON, TX 77071 | | | EXAMINER FREDMAN, JEFFREY NORMAN | |
| | | | ART UNIT 1637 | PAPER NUMBER |

DATE MAILED: 10/28/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/744,097

Applicant(s)

SHAHER, DAVID A

Examiner

Jeffrey Fredman

Art Unit

1637

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 14 February 2005.
- 2a) ☒ This action is **FINAL**. 2b) ☐ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 28-35 and 59-61 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 28-35, 59 and 60 is/are rejected.
- 7) ☒ Claim(s) 61 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
 2. ☐ Certified copies of the priority documents have been received in Application No. _____.
 3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date _____
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____

DETAILED ACTION

Election/Restrictions

1. Applicant's election with traverse of Group I and SEQ ID NO: 76 in the reply filed on September 8, 2005 is acknowledged. The traversal is on the ground(s) that there is no burden of search. This is not found persuasive because Applicant has not chosen to state that the sequences are not patentably distinct. In the absence of such a statement, a separate search and examination for each sequence is required. Each sequence is presumed patentably distinct in the absence of Applicant's statement and such a search would represent a significant burden of time both in the search by the automated systems and in the time required for review by the examiner. Therefore, the restriction remains proper.

The requirement is still deemed proper and is therefore made FINAL.

Claim Interpretation

2. Applicant's amendment has significantly altered the claims by requiring that both ends have a probe linker. The current claims are drawn to a series of method steps in a method which uses the open transitional phrase "comprising". As MPEP 2111.03 notes "The transitional term "comprising", which is synonymous with "including," "containing," or "characterized by," is inclusive or open-ended and does not exclude additional, unrecited elements or method steps."

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claim 28 is rejected under 35 U.S.C. 102(e) as being anticipated by Zhang et al (U.S. Patent 5,876,924).

Zhang teaches a method for detecting a target nucleotide sequence (see abstract) comprising:

a) rendering the target nucleotide sequence substantially single stranded to give a single-stranded target nucleotide sequence (see figure 2 and figure 6, where Zhang teaches hybridization of the probe to a single stranded target sequence),

b) hybridizing the single stranded target nucleotide sequence with a nucleic acid probe (see figures 2 and 6 and column 41, example 7) where the nucleic acid probe comprises a central sequence complementary to the target sequence and further comprises a probe linker at each terminal end which probe linker comprises a single stranded nucleotide sequence that does not hybridize to the target sequence (see figure 6 and column 41, example 7, where Amp-probe-2 hybridizes with nucleotides 39-79 and where nucleotides 1-38 and 80-100 are designed to not hybridize to the target sequence)

c) washing to remove any unbound probe (see column 41, lines 42-45 which refer to the method of Example 5, where in column 38, lines 45-50, the hybridized probe complex was washed),

d) hybridizing reporters to the two probe linker (see figure 6 and column 41, lines 40-45 where primers -3 and -4 were hybridized to the two probe linkers),

e) detecting the presence of said reporter to indicate the target sequence (see figure 6 and column 41, lines 40-45 where a PCR amplification step with primers -3 and -4 was performed as per example 5 and the resultant product detected (see column 39, lines 5-10)).

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 29-35 and 59-60 are rejected under 35 U.S.C. 103(a) as being unpatentable over Zhang et al (U.S. Patent 5,876,924) in view of Urdea et al (U.S. Patent 5,681,697).

Zhang teaches a method for detecting a target nucleotide sequence (see abstract) comprising:

a) rendering the target nucleotide sequence substantially single stranded to give a single-stranded target nucleotide sequence (see figure 2 and figure 6, where Zhang teaches hybridization of the probe to a single stranded target sequence),

b) hybridizing the single stranded target nucleotide sequence with a nucleic acid probe (see figures 2 and 6 and column 41, example 7) where the nucleic acid probe comprises a central sequence complementary to the target sequence and further comprises a probe linker at each terminal end which probe linker comprises a single stranded nucleotide sequence that does not hybridize to the target sequence (see figure 6 and column 41, example 7, where Amp-probe-2 hybridizes with nucleotides 39-79 and where nucleotides 1-38 and 80-100 are designed to not hybridize to the target sequence)

c) washing to remove any unbound probe (see column 41, lines 42-45 which refer to the method of Example 5, where in column 38, lines 45-50, the hybridized probe complex was washed),

d) hybridizing reporters to the two probe linker (see figure 6 and column 41, lines 40-45 where primers -3 and -4 were hybridized to the two probe linkers),

e) detecting the presence of said reporter to indicate the target sequence (see figure 6 and column 41, lines 40-45 where a PCR amplification step with primers -3 and -4 was performed as per example 5 and the resultant product detected (see column 39, lines 5-10)).

Zhang suggests amplification of the signal using signal probes as in figure 10 but does not expressly teach the use of nucleic acid reporter arrays.

Urdea teaches a method for detecting a target nucleotide sequence (see abstract) comprising:

a) rendering the target nucleotide sequence substantially single stranded to give a single-stranded target nucleotide sequence (see figure 1 and column 11, lines 37-39, where Urdea teaches the use of single stranded target sequence),

b) hybridizing the single stranded target nucleotide sequence with a nucleic acid probe (see figure 1 and column 11, lines 37-45) where the nucleic acid probe comprises a central sequence complementary to the target sequence and further comprises a probe linker at one terminal end which probe linker comprises a single stranded nucleotide sequence that does not hybridize to the target sequence (see figure 1 and column 10, line 61 to column 11, line 7, where the label extender probe comprises a region which hybridizes to the target and a second region which does not hybridize to the target),\

c) washing to remove any unbound probe (see figure 1 and column 11, lines 57-59),

d) joining the reporter to the linker (see figure 1 and column 11, lines 49-65),

e) detecting the presence of said reporter to indicate the target sequence (see figure 1 and column 11, line 65).

With regard to claim 29, Urdea teaches a first terminal probe linker (see figure 1).

With regard to claim 30, Urdea teaches a probe which comprises a first and second terminal probe linker (see figure 16, where the LE has an X and Y region that hybridizes to the Amp1 probe).

With regard to claim 34, Urdea teaches a direct interaction between the reporter and terminal probe linker (see figure 1).

With regard to claims 31, 32, 33, 35 and 36, Urdea teaches a multi-linking unit (which is a reporter array) which is double stranded in the interaction with the LE probe which is interposed between the reporter linker and the terminal linkers, where the multilinking unit of figure 8, for example, comprises single stranded regions which hybridize with multiple reporter probes placed end to end which hybridize to the unit which is hybridized to the terminal linkers and where there is a "terminator" or terminal reporter probe (see figures 1, 8 and 16).

With regard to claim 37, the reporter is a short oligonucleotide having a label unit (see figure 1).

With regard to claim 59, many of the Urdea probes comprise a TA sequence including, SEQ ID NO: 35 (see column 23, line 27, for example).

With regard to claim 60, Urdea teaches spacer segments which will comprise carbon (see column 8, lines 10-37, for example).

It would have been prima facie obvious to one of ordinary skill in the art at the time the invention was made to utilize the reporter system of Urdea as the signal amplification method in the method of Zhang since Zhang expressly teaches signal amplification with signal probes (see figure 10, for example) and since Urdea teaches "The invention increases both the sensitivity and specificity of such assays, by reducing the incidence of signal generation that occurs in the absence of target, and does not

involve a substantial increase in either time or cost relative to current assay configurations. In certain embodiments, the invention is also effective in compensating for the loss in signal that can result when background noise is reduced. (see column 2, lines 45-51).” An ordinary practitioner, motivated by Zhang to improve signal with signal probes, would have been motivated to use the signal amplification method of Urdea since it would improve sensitivity, specificity and compensate for signal reduction.

Claim Objections

7. Claim 61 is objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

8. Claim 61 is objected to since the claim incorporates non elected subject matter. This claim cannot currently be allowed because nonelected sequences are present. In order to place the claim in condition for allowance, in addition to rewriting the claim in independent form, the nonelected sequences must be deleted.

9. The elected sequence in claim 61, SEQ ID NO: 76, is novel and unobvious over the prior art because no prior sequence containing SEQ ID NO: 76 was identified in the sequence search.

Response to Arguments

10. Applicant's arguments with respect to the claims have been considered but are moot in view of the new ground(s) of rejection necessitated by Applicant's amendment.

Art Unit: 1637

Conclusion

11. Applicant's amendment necessitated the new ground(s) of rejection presented in this Office action. Accordingly, **THIS ACTION IS MADE FINAL**. See MPEP § 706.07(a). Applicant is reminded of the extension of time policy as set forth in 37 CFR 1.136(a).


A shortened statutory period for reply to this final action is set to expire THREE MONTHS from the mailing date of this action. In the event a first reply is filed within TWO MONTHS of the mailing date of this final action and the advisory action is not mailed until after the end of the THREE-MONTH shortened statutory period, then the shortened statutory period will expire on the date the advisory action is mailed, and any extension fee pursuant to 37 CFR 1.136(a) will be calculated from the mailing date of the advisory action. In no event, however, will the statutory period for reply expire later than SIX MONTHS from the date of this final action.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Jeffrey Fredman whose telephone number is (571)272-0742. The examiner can normally be reached on 6:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Gary Benzion can be reached on (571)272-0782. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 1637

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


Jeffrey Fredman
Primary Examiner
Art Unit 1637

10/27/05